

What is claimed is:

1. A discrete package comprising:
 - a lead frame pad which has a first surface and a second surface, the second surface which is the opposite surface of the first surface;
 - leads connected to a side of the lead frame pad;
 - a semiconductor chip attached to the first surface of the lead frame pad;
 - a ceramic layer which is positioned to directly contact the second surface of the lead frame pad; and
 - a molding material which entirely encapsulates the lead frame pad, the semiconductor chip, and a portion of the ceramic layer, except the leads and the second surface of the ceramic layer.
2. The discrete package of claim 1, where the leads are formed to have steps with respect to the lead frame pad.
3. The discrete package of claim 1, further comprising wires which electrically connect the leads to the semiconductor chip.
4. The discrete package of claim 1, wherein the lead frame pad is formed to a thickness of 0.5 mm.
5. The discrete package of claim 1, further comprising an adhesive between the lead frame pad and the semiconductor chip.
6. A discrete package comprising:
 - a lead frame pad which has a first surface and a second surface, the second surface which is the opposite surface of the first surface;
 - leads which are connected to a side of the lead frame pad;
 - a semiconductor chip which is attached to the first surface of the lead frame pad;
 - a ceramic layer which is attached with the second surface of the lead frame pad via an epoxy; and

a molding material which entirely encapsulates the lead frame pad, the semiconductor chip, and a portion of the ceramic layer, except the leads and the second surface of the ceramic layer.

7. The discrete package of claim 6, wherein the leads are formed to have steps with respect to the lead frame pad.

8. The discrete package of claim 6, further comprising wires which electrically connect the leads to the semiconductor chip.

9. The discrete package of claim 6, wherein the lead frame pad is formed to a thickness of 0.5 mm.

10. The discrete package of claim 6, further comprising an adhesive between the lead frame pad and the semiconductor chip.

11. A discrete semiconductor package, comprising:
a lead frame having a first surface and a second surface with a lead connected to the lead frame;
a semiconductor chip attached to the first surface of the lead frame;
a ceramic layer having a first surface and a second surface, wherein the first surface of the ceramic layer is directly attached to the second surface of the lead frame; and
a molding material which encapsulates the lead frame, the semiconductor chip, a portion of the lead, and a portion of the second surface of the ceramic layer.

12. The package of claim 11, wherein the first surface of the ceramic layer does not contain a conductive layer.

13. The package of claim 11, wherein the ceramic layer is attached to the lead frame by using the molding material.

14. A discrete semiconductor package, comprising:
a lead frame having a first surface and a second surface with a lead connected to the lead frame;
a semiconductor chip attached to the first surface of the lead frame;
a ceramic layer having a first surface and a second surface, wherein the first surface of the ceramic layer is attached to the second surface of the lead frame via an epoxy; and
a molding material which encapsulates the lead frame, the semiconductor chip, a portion of the lead, and a portion of the second surface of the ceramic layer.

15. An electronic apparatus containing a packaged semiconductor device, the device comprising:
a lead frame having a first surface and a second surface with a lead connected to the lead frame;
a semiconductor chip attached to the first surface of the lead frame;
a ceramic layer having a first surface and a second surface, wherein the first surface of the ceramic does not contain a conductive layer and is attached to the second surface of the lead frame; and
a molding material which encapsulates the lead frame, the semiconductor chip, a portion of the lead, and a portion of the second surface of the ceramic layer.

16. The apparatus of claim 15, wherein the first surface of the ceramic layer is directly attached to the second surface of the lead frame.

17. The apparatus of claim 15, wherein the ceramic layer is attached to the lead frame by using the molding material.

18. The apparatus of claim 15, wherein the ceramic layer is attached to the lead frame via an epoxy located between ceramic layer and the lead frame.

19. A method for making a packaged semiconductor device, comprising:
providing a lead frame having a first surface and a second surface with a lead connected to the lead frame;
providing a semiconductor chip attached to the first surface of the lead frame;
providing a ceramic layer having a first surface and a second surface, wherein the first surface of the ceramic does not contain a conductive layer and is attached to the second surface of the lead frame; and
providing a molding material which encapsulates the lead frame, the semiconductor chip, a portion of the lead, and a portion of the second surface of the ceramic layer.

20. A method for making a packaged semiconductor device, comprising:
providing a lead frame having a first surface and a second surface with a lead connected to the lead frame;
attaching a semiconductor chip to the first surface of the lead frame;
attaching a first surface of a ceramic layer to the second surface of the lead frame, wherein the first surface of the ceramic layer does not contain a conductive layer; and
encapsulating the lead frame, the semiconductor chip, a portion of the lead, and a portion of a second surface of the ceramic layer.

21. The method of claim 20, further comprising directly attaching the first surface of the ceramic layer to the second surface of the lead frame.

22. The method of claim 20, wherein the encapsulation is performed using a molding material.

23. The method of claim 22, further comprising attaching the ceramic layer to the lead frame by using the molding material.

24. The method of claim 20, further comprising attaching the ceramic layer to the lead frame by using an epoxy.

25. A method for making an electronic apparatus, comprising:

providing a packaged semiconductor device by providing a lead frame having a first surface and a second surface with a lead connected to the lead frame, attaching a semiconductor chip to the first surface of the lead frame, attaching a first surface of a ceramic layer to the second surface of the lead frame, wherein the first surface of the ceramic layer does not contain a conductive layer, and encapsulating the lead frame, the semiconductor chip, a portion of the lead, and a portion of a second surface of the ceramic layer;

providing an outer heat sink; and

connecting the packaged semiconductor device to the outer heat sink.